

REMARKS

Claims 1-11 are pending in this application. By this Amendment, claims 1 and 2 are amended. No new matter is added. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Applicants gratefully acknowledge that the Office Action indicates that claims 3 and 11 contain allowable subject matter. However, for at least the reasons described below, Applicants respectfully submit that all claims 1-11 are allowable.

The Office Action objects to claims 1 and 3-11 for a lack of antecedent basis. Claim 1 is amended to replace "*in the lengthways direction*" with "*from each other*" to overcome the objection, and is amended to correct a minor informality in line five. Further, claim 2 is amended in a similar manner. Applicants respectfully request that the Examiner withdraw the objection.

The Office Action rejects claims 1, 2, and 4-10 under 35 U.S.C. §103(a) as being unpatentable over Cunniff (U.S. Patent No. 5,239,177), in view of Bremer (U.S. Patent No. 5,279,044). Applicants respectfully traverse the rejection.

Specifically, Applicants assert that neither Cunniff nor Bremer disclose or suggest, individually or in combination, "*an encoder comprising a scale and a scale reader; the scale having a plurality of reference marks spaced apart from each other; the scale reader including a sensor which reads the reference marks; characterized in that: the reference marks are arranged along the scale in a random or pseudo-random pattern; as the scale reader moves over the pattern of the reference marks, the pattern is continually compared with a previously stored pattern; and when the pattern of the reference marks matches the previously stored pattern, a reference signal is output,*" as recited in independent claim 1, or "*an encoder comprising a scale and a scale reader; the scale having a series of incremental marks, and a plurality of reference marks spaced apart from each other; the scale reader*

including one or more sensors which read the incremental marks and produce an output therefrom, and which read the reference marks; characterized in that: the reference marks are arranged along the scale in a random or pseudo-random pattern; as the scale reader moves over the pattern of the reference marks, the pattern is continually compared with a previously stored pattern; and when the pattern of the reference marks matches the previously stored pattern, a reference signal is output," as recited in independent claim 2.

Cunniff, in column 4, lines 1-2, discloses a temporal pulse generating apparatus "employing the use of a 'perfect word' 12 to denote a reference mark on a rotating disk 13." Accordingly, Cunniff discloses a single reference mark as opposed to a plurality of reference marks.

Bremer discloses, in column 1, lines 10-14, a measuring device for determining an absolute position of a movable element, comprising a scale graduation element with a number of tracks and a pick-up device which comprises a number of sensing elements which corresponds to the number of tracks. Therefore, Bremer also fails to disclose all of the features recited in claims 1 and 2, and does not make up for the deficiencies of Cunniff. Accordingly, Applicants respectfully assert that neither Cunniff nor Bremer disclose or suggest, individually or in combination, all of the features of independent claims 1 and 2.

Furthermore, Applicants assert that there is no motivation, either in the Cunniff or Bremer, or in the knowledge generally available to one of ordinary skill in the art, to modify Cunniff or Bremer, or to combine the teachings of the aforementioned references because: 1) the proposed modification renders the prior art unsatisfactory for its intended purpose; and 2) the proposed modification changes the principle of operation of either reference.

Specifically, Cunniff, in column 4, lines 1-32, teaches the use of a "perfect word" of more than one bit as it "permits the use of a reference mark with longer duration and therefore greater energy and information content" and "results in radically lower false detection rates."

The use of a longer reference mark code in Cunniff's apparatus is significantly different from the present invention's use of a longer reference mark code, where the mark code is used to ensure that the code repeats at certain intervals to provide a unique reference mark in a given length of scale (page 18, lines 18-20, and page 19, lines 11-25 of the present invention).

Further, Bremer, in column 3, lines 30-52, teaches a measuring device comprising an incremental track and an absolute track, where the absolute track produces a specific code for each pitch of the incremental track; combining the code with the absolute measure within a pitch, obtained by scanning the incremental track, to give a measurement value of the absolute position of the sensor on the scale at any given point along the scale; converting the measurement value to an output signal, which is different for each point on the scale. The device of Bremer is very different from the present invention, where a signal is produced only when the specified reference mark is recognized.

Thus, the combination of Cunniff's apparatus (containing only a single reference mark) with the device of Bremer (providing a continually updated absolute position value at all points along the scale, with no need to zero a counter at a position of one particular reference mark) will result in a device which has an absolute value associated with all points along the scale and no need for a reference mark, and not a device which provides a choice for a position of a single reference.

Therefore, it would not have been obvious to one of ordinary skill in the art at the time the invention was made to combine Cunniff and Bremer because there is no motivation, either in Cunniff or Bremer, or in the knowledge generally available to one of ordinary skill in the art, to modify Cunniff or Bremer, or to combine the teachings of the aforementioned references.

In accordance with the above remarks, Applicants submit that independent claims 1 and 2 define patentable subject matter. Claims 4-10 depend from claim 1, and therefore, also

define patentable subject matter, as well as for the additional features they recite. Thus, Applicants respectfully request that the Examiner withdraw the rejection.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-11 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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